

UNITED STATES DISTRICT COURT
DISTRICT OF NEW HAMPSHIRE

Kevin Brown, et al.

v.

Civil No. 16-cv-242-JL
Opinion No. 2023 DNH 155

Saint-Gobain Performance Plastics
Corporation, et al.

MEMORANDUM ORDER

To rule on the motions at bar, the court must apply the standards set forth in [Federal Rule of Evidence 702](#) to determine the admissibility of several expert opinions related to environmental contamination and resulting economic damages. The expert reports form part of the parties' evidence in this putative class action, in which the plaintiffs allege harm caused by the release of toxic chemicals from a manufacturing facility in Merrimack, New Hampshire that is now owned by defendant Saint-Gobain Performance Plastics Corporation. After reviewing the parties' submissions and hearing oral argument and live testimony, the court grants some of the parties' motions in part. Specifically, the court concludes that the opinion of Dr. James Vernon, the plaintiffs' expert, is inadmissible. Certain opinions of the other experts are also excluded in part, consistent with their qualifications and the limits placed by [Rule 702](#).

I. Legal standard

[Rule 702](#) governs the admissibility of expert opinion evidence in federal court. It provides as follows.

A witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if:

- (a) the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue;
- (b) the testimony is based on sufficient facts or data;
- (c) the testimony is the product of reliable principles and methods; and
- (d) the expert's opinion reflects a reliable application of the principles and methods to the facts of the case.¹

[Fed. Rule of Evid. 702.](#)

The proponent bears the burden of showing that the expert opinion is reliable and relevant under [Rule 702](#). [Martínez v. United States](#), 33 F.4th 20, 24 (1st Cir. 2022). In assessing whether an expert opinion should be admitted, the court serves in a gatekeeping role.² [Id.](#) Specifically, the court must determine whether the testimony has a proper foundation. [See, e.g., Daubert v. Merrell Dow Pharms., Inc.](#), 509 U.S. 579, 597 (1993). In making this assessment, the court is tasked to focus on the process that generated the opinion, and not on the merits of the opinion itself. [López-Ramírez v. Toledo-González](#),

¹ [Rule 702](#) was amended, effective December 1, 2023, to “clarify and emphasize that expert testimony may not be admitted unless the proponent demonstrates to the court that it is more likely than not that the proffered testimony meets the admissibility requirements set forth in the rule.” [Fed. R. Evid. 702](#) Comm. Notes to 2023 Amendments. The parties’ motions to exclude were submitted before this amendment took effect. The court recites the rule in its amended form in this Order, but the court’s analysis and rulings remain the same under the previous and the current versions of the Rule.

² There is some dispute among circuit courts of appeal as to whether [Rule 702](#) must be satisfied at the class certification stage. [See Hicks v. State Farm Fire & Cas. Co.](#), 965 F.3d 452, 465 (6th Cir. 2020) (citing cases). The First Circuit Court of Appeals has not ruled on this issue. Nevertheless, the parties agree that the Rule applies here, as they both move to exclude experts under it. The court accordingly determines the experts admissibility consistent with the standards set forth in [Rule 702](#).

32 F.4th 87, 94 (1st Cir. 2022) (citing Daubert, 509 U.S. at 595). If “the factual underpinning of an expert’s opinion is weak,” which may affect “the weight and credibility of the testimony,” that is a matter for the jury, not the court, to resolve. United States v. Jackson, 58 F.4th 541, 551 (1st Cir. 2023).

II. Background

The facts of this case are detailed in the court’s Order on Class Certification, which is issued alongside this Order.³ For ease of reference, the court summarizes a few, key details below.

Saint-Gobain has owned and operated a manufacturing facility in Merrimack, New Hampshire since 2000. Prior to 2000, Chemfab Corporation owned and operated the facility. As part of its manufacturing operations, the facility used ammonium perfluorooctonate (APFO), which is a derivative of perfluorooctanoic acid (PFOA). Both APFO and PFOA are part of a group of toxic substances known as PFAS.⁴ PFOA is water soluble and resistant to environmental degradation, enabling it to travel from the air, through the soil, and then into the groundwater.⁵

³ See Class Certification Order (doc. no. 438) at 5-24.

⁴ The court refers to PFOA and PFAS collectively as PFOA throughout this Order, except when quoting other sources that refer to the substances differently. These shifts in nomenclature, where present, do not factor into the parties’ arguments or affect the [Rule 702](#) analysis.

⁵ See Preliminary Air Soil and Water Modeling Technical Memorandum June 2017 – revised September 2018 (“Barr Report”) (doc. no. [246-5](#)) at 11 (“PFOA does not readily degrade[,]” “is deposited on the ground in proximity to the emission source[,]” and is “mobile and migrate[s] as [a] solute[] in flowing groundwater”); id. at 14 (“[A]t some manufacturing facilities that make or use PFAS compounds, air emission and subsequent deposition on nearby land surfaces has been found to be a mechanism for PFOA to be transported to groundwater (Barton, et al, 2010).”).

On March 4, 2016, the New Hampshire Department of Environmental Services issued a press release stating that, during the prior week, “Saint-Gobain notified NHDES that [PFOA] was detected at low levels . . . in samples taken from four water faucets within their Merrimack facility.”⁶ The NHDES announced that it would be investigating Merrimack Village District Water Works groundwater wells, which “cumulatively serve 25,000 customers in Merrimack,” and “private wells in the vicinity of the Saint-Gobain facility” to determine if they were contaminated with PFOA.⁷ The NHDES later confirmed that it did detect PFOA “in excess of applicable regulatory standards for groundwater . . . near the Saint-Gobain . . . facility,” and it responded to this discovery with a number of remedial measures, including the distribution of bottled water to affected residents and the expansion of municipal water lines to contaminated properties.⁸

Around this time period, Saint-Gobain hired Barr Engineering Company to develop models to “evaluate and simulate the transport mechanisms of PFOA released by historical air emissions at the Saint-Gobain . . . facility in Merrimack . . . that may have resulted in the presence of PFOA in soil and groundwater in the vicinity of th[e] facility.”⁹ Barr employed four models developed by the United States Environmental Protection Agency or the United States Geological Services to estimate the movement of

⁶ Doc. no. [247-7](#) at 2.

⁷ [Id.](#)

⁸ Barr Report (doc. no. [246-5](#)) at 10; see also doc. no. [246-20](#).

⁹ Barr Report (doc. no. [246-5](#)) at 9.

the PFOA emissions from the air, to the soil, and below to groundwater.¹⁰ Barr used AERMOD “for simulating dispersion and deposition of PFOA” onto the ground “from stack emissions”; Soil Water Balance “for simulating recharge using data for precipitation, temperature, soils, land use, and topography”; MODFLOW-NWT “for simulating three dimensional saturated groundwater flow and one-dimensional vertical groundwater flow through the unsaturated zone”; and MT3D-USGS “for simulating solute transport in the saturated and unsaturated zone.”¹¹ In short, the first two models “generalize many ‘above-ground’ processes relevant to PFOA transport, whereas key subsurface processes are approximated using” the latter two models.¹² Further, the MODFLOW and MT3D models produce “output that can be directly evaluated [against] measured data,” including “measured concentration of PFOA in soils[] and measured concentrations of PFOA in groundwater.”¹³

Barr released a preliminary report with its findings in June 2017. It revised the report in September 2018 to correct two tables but did not otherwise amend the report or its conclusions.¹⁴ Barr concluded that it had “successfully modeled [t]he overall pattern and distribution” of PFOA in soil and groundwater within its study area, and it found that the air deposition of PFOA from Saint-Gobain’s facility “may have contributed to the

¹⁰ See 2018 Expert Report of David Sullivan (doc. no. 122) at 11; Barr Report (doc. no. 246-5) at 9, 14, 68.

¹¹ Barr Report (doc. no. 246-5) at 9.

¹² 2021 Expert Report of Michael Mobile (doc. no. 404-4) at 11.

¹³ Id.

¹⁴ Barr Report (doc. no. 246-5) at 3.

observed PFOA in groundwater in portions of the study area located in close proximity to the . . . facility.”¹⁵ Barr also noted in its report that “PFAS . . . were used in the manufacture of many commercial materials for industrial, commercial, and residential use,” and thus “[t]here are numerous other likely source of PFAS in the study area” including car washes, landfills, junkyards, and agricultural fields.¹⁶ Barr did not analyze the movement of PFOA from these potential, alternative sources in its study.¹⁷

Meanwhile, in May 2016, the named plaintiffs filed a putative class action complaint against Saint-Gobain and Gwenael Busnel (the facility’s general manager during the relevant time period) in state court, and Saint-Gobain removed the case to this court the following month. The plaintiffs assert claims against Saint-Gobain and Busnel for trespass, nuisance, negligence, and negligent failure to warn, and against Saint-Gobain for Busnel’s actions,¹⁸ under the theory of respondeat superior. They allege damages in the form of discomfort, annoyance, loss of use and enjoyment of property, diminished property value, the need for and cost of mitigating contamination, and, for private well owners, the costs associated with switching from private wells to municipal water.¹⁹

¹⁵ [Id.](#) at 9.

¹⁶ [Id.](#) at 9-10.

¹⁷ [Id.](#) at 9.

¹⁸ Saint-Gobain and Busnel are hereinafter referred to together as “the defendants” or “Saint-Gobain.”

¹⁹ Mot. for Class Cert (doc. no. [255-1](#)) at 25; Third Amended Compl. (doc. no. [348](#)) at ¶¶ 1, 53.

The “proposed class consist[s] of residential property owners within defined geographic areas” who are allegedly “impacted by” groundwater contamination related to PFOA emissions from the Saint-Gobain facility.²⁰ The class includes individuals who obtain their household water from two sources—private wells and municipal water, or the Merrimack Village District Water Works system. The putative class and two subclasses are defined as follows:

All persons who on or after March 4, 2016 own or owned residential properties with private wells in the Private Well Property Owners Class Geographic Area or residential properties in the Merrimack Village District Water Works (MVDWW) Class Geographic Area which are supplied household water by MVDWW (Property Damage Class).

Subclass A:

All persons who on or after March 4, 2016 own or owned residential properties with private groundwater wells within the Private Well Class Geographic Area (Private Well Property Owners Property Damage Subclass).

Subclass B:

All persons who on or after March 4, 2016 own or owned residential properties in the Merrimack Village District Water Works (MVDWW) Class Geographic Area which are supplied household water by MVDWW (MVDWW Property Owners Property Damage Subclass).²¹

The plaintiffs define the MVDWW Class Geographic Area to reflect the MVDWW service map, and they define the Private Well Class Geographic area as follows.

In Bedford and Merrimack, the geographic area west of the Merrimack River within three (3.0) miles of the property boundary of the Saint-Gobain Site; in

²⁰ Mot. for Class Cert. (doc. no. [255-1](#)) at 25.

²¹ [Id.](#) at 26-27.

Litchfield, the Geographic area bounded by the Merrimack River on the west, Cummings Drive on the South, extended east to the Merrimack River and west to the Londonderry Town line, and the Londonderry Town line on the East and the City of Manchester on the North and East, and the geographic area in Manchester bounded by Raymond Wieczorek Drive on the North and East, and the geographic area in Manchester bounded by Raymond Wieczorek Drive on the North²²

Both parties submitted expert reports to support their positions, many of which are now the target of motions to exclude under [Rule 702](#).

III. Analysis

The parties assert challenges against 14 experts in total. The first set of experts are referred to as “fate and transport” experts. They opine on the movement of PFOA from air, to the ground, and beneath to the groundwater. The second set of experts provide opinions on damages. Below, the Order proceeds in four parts. The court begins by assessing the admissibility of the opinions of the plaintiffs’ fate and transport experts, and then the defendants’ fate and transport experts. Following that, the court turns to the opinions of the plaintiffs’ experts on damages, and finally the defendants’ experts on damages.

A. Admissibility of the plaintiffs’ fate and transport experts

The defendants challenge the opinions provided by David Sullivan, Hyeong-Moo Shin, Russell Detwiler, Christopher Baggett, and James Vernon. As an initial matter, the plaintiffs do not object to the exclusion of Vernon’s opinion in their briefs. The court

²² [Id.](#) at 27.

accordingly considers any objection waived and grants the defendants' motion as to Vernon. See, e.g., United States v. Zannino, 895 F. 2d 1, 17 (1st Cir. 1990) (“[I]ssues adverted to in a perfunctory manner, unaccompanied by some effort at developed argumentation, are deemed waived.”). The court now analyzes the admissibility of the remainder of the opinions of the plaintiffs' fate and transport experts.

1. The experts' qualifications, methodologies, and opinions

The court begins with a description of the experts' qualifications, methodologies, and opinions. Based on this information, the plaintiffs have demonstrated that their fate and transport experts are qualified to provide the opinions that they presented in this case, and the experts rely on well-recognized and accepted methods to formulate the opinions.

David Sullivan. David Sullivan is a certified consulting meteorologist with an M.S. degree in meteorology and 45 years experience in air quality meteorology. His “areas of expertise include air quality dispersion modeling, air quality monitoring, meteorological monitoring, exposure assessment, and media transfers of airborne pollutants to surface soils and other surfaces.”²³ Sullivan has experience in conducting major studies of toxic air pollutants for the EPA, and his work has included evaluating the air deposition pathways for particulate emissions from pesticide application, smelting operations, saltwater cooling towers, paper processing, diesel truck traffic, and PFOA deposition. He has modeled and assessed air transport and dispersion of air pollutants

²³ 2020 Expert Report of David Sullivan (doc. no. [378-9](#)) at 7.

from facilities like the one at issue in this case. He currently uses the AERMOD dispersion model in his practice, but he also uses other models when needed.

In his report, Sullivan opined on the “airborne deposition pathway” for PFOA “and the observed PFAS contamination in groundwater” in the class areas.²⁴ To carry out his analysis, Sullivan reviewed Barr’s modeling of the movement of Saint-Gobain’s PFOA emissions using AERMOD, and he compared the AERMOD results with data on the concentration of PFOA in groundwater in the class areas, which was gathered from the sampling of “hundreds of sites” from 2016 to 2018.²⁵ He also visited the Saint-Gobain facility and the “Plaintiffs’ properties,” evaluated meteorological data, and reviewed other information about PFOA.²⁶

Sullivan represented that he followed methods that are consistent with well-accepted air quality meteorological practice and his years of experience in the field. He also explained that his AERMOD analysis “addresses long-term averaging of concentration and deposition” but does not estimate PFOA concentrations at a specific location and a specific time.²⁷

Sullivan concluded that “the Saint-Gobain facility is the source of the high levels of PFAS contamination measured throughout the class geographic area[s].”²⁸ More

²⁴ [Id.](#) at 10.

²⁵ 2018 Expert Report of David Sullivan (doc. no. [122](#)) at 12.

²⁶ 2020 Expert Report of David Sullivan (doc. no. [378-9](#)) at 17.

²⁷ [Id.](#) at 25.

²⁸ 2018 Expert Report of David Sullivan (doc. no. [122](#)) at 12.

specifically, he found that “dispersion of PFAS emissions from the Saint-Gobain facility . . . occurs on an area-wide basis . . . throughout the boundaries of the class geographic areas, including all properties within these boundaries, including each class representative’s property” and “the locations of the MVDWW wells,” and this deposition “occurred throughout the class areas each year [that] Saint-Gobain” and the facility’s previous owner Chemfab “were in operation and used APFO.”²⁹ Sullivan further noted that the pattern of groundwater contamination in the class areas is consistent with Saint-Gobain as the source, with the concentration of PFOA decreasing as distance from the facility increases, and approaching zero “at the most distant locations” from the facility.³⁰

Hyeong-Moo Shin. Hyeong-Moo Shin, Ph.D. earned his doctoral degree in environmental health sciences from the University of California, Irvine, and has five years of post-doctoral training from the University of California, Davis. He has 15 years of research experience in environmental health sciences and has focused on modeling the fate and transport of toxic chemicals to evaluate their health effects. He has authored or co-authored fourteen peer-reviewed papers related to PFOA exposure and epidemiologic studies. Shin was also been deemed qualified to give opinions on the fate and transport of PFOA in a case similar to this one. See also [Baker v. Saint-Gobain Performance Plastics Corp](#), 2021 WL 2548825, at *8 (W.D.N.Y. May 5, 2021) (noting Dr. Shin’s qualifications and denying defendant’s motion to exclude his opinions).

²⁹ 2020 Expert Report of David Sullivan (doc. no. [378-9](#)) at 11.

³⁰ 2018 Expert Report of David Sullivan (doc. no. [122](#)) at 12; see also 2020 Expert Report of David Sullivan (doc. no. [378-9](#)) at 10-11.

In his report, Shin asserted that his opinions are based on his education and experience as an environmental health scientist, his research into the health effects of PFOA exposure, certain enumerated publications pertaining to the emission and dispersion of PFOA in the environment, and the Barr Report. After his review, Shin concluded that the four models used for the Barr Report study were reliable, widely accepted, and widely used in environmental science and engineering.³¹ .

Shin began with the premise that PFOA that is emitted into the air by manufacturing facilities is deposited on the ground, and it can travel through soil to groundwater. He described those “transport mechanisms (or pathways)” as “well-accepted for explaining local environmental contamination of chemicals that are emitted to air from manufacturing facilities and are extremely persistent in an outdoor environment including PFOA.”³² Shin also stated that peer-reviewed literature supports the conclusion that “the primary source of PFOA contamination in drinking water in the United States and around the world is . . . PFOA/APFO released from manufacturing facilities.”³³

Shin concluded that emissions of PFOA from the Saint-Gobain facility “contributed to the observed PFAS in groundwater in the class area.”³⁴ He partly based this opinion on the pattern of contamination seen in the class areas, with high

³¹ 2020 Expert Report of Hyeong-Moo Shin (doc. no. [236-7](#)) at 8.

³² [Id.](#) at 7, 9.

³³ [Id.](#) at 13.

³⁴ [Id.](#) at 7.

concentrations of PFOA observed in the wells closer to the facility, as well as “along the valley that includes low elevations” and in upstream wells.³⁵ According to Shin, this pattern is explained by “the topographic features present at the point of the air emissions,” such as the “steep hills to the east and the west” of the facility, and the “northerly and southerly winds” that transported PFOA from the facility.³⁶ Shin also opined that other sources of PFOA listed in the Barr Report “did not cause PFOA groundwater contamination in the class areas,” in part because they are not proven to cause widespread PFOA contamination.³⁷

Russell Detwiler. Russell Detwiler, Ph.D. earned his doctoral degree in civil engineering from the University of Colorado. He is an associate professor in the department of Civil and Environmental Engineering at the University of California, Irvine. His academic work and research have focused on groundwater hydrology. Detwiler is also a principal investigator in a project studying the human health effects of drinking water that contains PFOA. Detwiler’s work for that project involves modeling the migration of PFOA from wastewater treatment plants to groundwater wells in Orange County, California.

For this case, Detwiler reviewed two of the models used in the Barr Report—the MODFLOW and MT3D models—which analyze the movement of PFOA from the

³⁵ [Id.](#) at 10.

³⁶ [Id.](#)

³⁷ [See id.](#) at 15-16.

ground surface to the water table and then the underlying aquifer.³⁸ He found that Barr’s analysis “underestimated measured [PFOA] concentrations in some wells.”³⁹ Detwiler recalibrated the models to more “closely match” actual measurements of PFOA concentrations in various MVDWW wells, and he tested the models’ “sensitivity to different parameters.”⁴⁰

Detwiler then concluded that two of his recalibrated models, which he referred to as Models 3 and 4, “bracket the likely actual concentrations of [PFOA] over time” and indicate “elevated PFOA concentrations in [] wells within the class area in the years since 2016.”⁴¹ At the end of his report, Detwiler included a table listing the average annual PFOA concentrations at five of the MVDWW wells from 1986 through 2030, as estimated by Models 3 and 4.⁴²

Christopher Baggett. Christopher Baggett is a licensed professional engineer with a B.S. degree in civil engineering from the University of Florida. He is currently a senior project manager in the engineering firm Wright-Pierce. Baggett has expertise in the analysis, modeling, and design of water, wastewater, and reclaimed water systems, and he is proficient in the use of hydraulic modeling software. Baggett developed his report in consultation with two colleagues at Wright-Pierce: Christopher Berg, a licensed

³⁸ 2020 Expert Report of Russell Detwiler (doc. no. [231-10](#)) at 3.

³⁹ [Id.](#) at 5.

⁴⁰ [Id.](#) at 2, 7.

⁴¹ [Id.](#) at 8.

⁴² [See id.](#) at 14.

professional engineer and Wright-Pierce's Water Practice State Group Leader for New Hampshire, and Saheb Mansour-Rezaei, a licensed professional engineer and the Lead Project Engineer in the Wright-Pierce Water Treatment Practice Group.

Baggett used a "water quality model" called WaterGEMS to simulate the transport of PFOA throughout the MVDWW distribution system and to produce "reasonable estimates" of PFOA concentrations "at various locations in the . . . system" from 2001 through 2019.⁴³ In completing this analysis, Baggett relied on his education and experience, as well as the reports and information made available to him regarding water quality monitoring of the MVDWW system, the history of the MVDWW groundwater wells, and various features of the system.

Baggett fed a variety of information into his water quality model, including Detwiler's estimates of PFOA concentrations in the MVDWW wells; measured PFOA concentrations in the MVDWW wells, where available; characteristics of the MVDWW system's water pipes; and data on ground topography, water use, and well production. Using the results from his model, Baggett calculated the "average daily PFOA concentration in the MVDWW water within each model pipe."⁴⁴ He then identified the location of "each served residential property" and "associated" each property "with the nearest model pipe," which allowed him to determine "the average daily PFOA concentrations for all served residential properties" from 2001 through 2019.⁴⁵ He

⁴³ 2020 Expert Report of Christopher C. Baggett (doc. no. [231-11](#)) at 8, 10.

⁴⁴ [Id.](#) at 32.

⁴⁵ [Id.](#)

combined this information with estimated property ownership periods to identify the “served residential properties that likely received drinking water with an average daily PFOA concentration of” at least 20 ppt or at least 70 ppt “for 365 days or more within each property ownership period.”⁴⁶ He identified several properties that fell into each category.

2. The defendants’ challenges

The defendants assert four main challenges against the fate and transport experts’ opinions. While some critiques apply to all four experts, others apply to a subset. The court considers each challenge in turn below.

Reliance on the Barr Report models. The defendants first critique the experts’ reliance on the models used in the Barr report. As previously noted, Barr used four models—AERMOD, Soil-Water Balance, MODFLOW-NWT, and MT3D-USGS—“to evaluate and simulate transport mechanisms of PFOA” from the Saint-Gobain facility and “to identify areas where exceedances of regulatory standards [in soil and groundwater] potentially may be associated with historical air emissions from the Saint Gobain Facility.”⁴⁷ According to the defendants, “Barr developed its single-source, regional-scale model” for only limited purposes “to meet specific area-wide regulatory objectives,” and the plaintiffs’ experts used the models “for purpose well outside [the model’s] scope and design.”⁴⁸ The defendants point, in particular, to a 2017 letter from

⁴⁶ [Id.](#)

⁴⁷ Barr Report (doc. no. [246-5](#)) at 9.

⁴⁸ Defs.’ Mot. to Exclude Fate and Transport Experts (doc. no. [306-1](#)) at 17-18.

the NHDES to Saint-Gobain, in which the NHDES stated that “the many generalizations and simplifications inherent in the [Barr] model make it an inappropriate tool for understanding localized conditions and predicting concentrations in various media in the Site vicinity at a property or neighborhood scale.”⁴⁹

In order to assess the strength of this challenge, the court starts with Barr’s stated purpose in conducting its modeling. Consistent with the NHDES’s letter, Barr explained in its report that it used the four models for “regional” modeling, and not “site-specific modeling performed to simulate groundwater flow conditions in a small area. . . .”⁵⁰ Barr also acknowledged the potential presence of other PFOA sources in the study area but focused its analysis on the effect of Saint-Gobain’s PFOA emissions. It concluded from its analysis that Saint-Gobain “may have contributed” to the groundwater contamination in portions of its study area.⁵¹

Even if the court assumes that Barr’s stated objectives define the limits or intended uses of the four fate and transport models it employed (as the defendants seemingly contend), the court does not find a clear conflict between the purpose and parameters of Barr’s analysis and that of the plaintiffs’ experts, such that the experts’ use of the same models would be improper. Like Barr, the experts’ task was to investigate and report on the movement of PFOA emissions from the Saint-Gobain facility (and not other sources)

⁴⁹ NHDES 2017 Letter (doc. no. 308-11) at 2.

⁵⁰ Barr Report (doc. no. 246-5) at 10.

⁵¹ [Id.](#) at 9.

to the class areas. Further, and also consistent with Barr, the experts conducted their analysis on an area-wide, and not neighborhood or property-by-property, basis.

Indeed, while Sullivan claimed that he could use the data to reliably estimate the “dispersion and deposition of pollutants emitted from the Saint-Gobain facility at locations throughout the class geographic area,” he did not do so.⁵² He asserted that “it is neither necessary nor appropriate to model air quality or deposition impacts separately on a location-by-location basis to evaluate dispersion and deposition of APFO from the Saint-Gobain facility,” or “to show that the PFAS contaminants from the Saint-Gobain facility were dispersed throughout and beyond the class geographic area.”⁵³ Similarly, Shin opined on Saint-Gobain’s contributions to PFOA contamination across the class areas, and not at a specific site or property.

Further, Detwiler used the MODFLOW and MT3D models to develop estimates of the annual PFOA concentrations in the MVDWW wells, but the record indicates that Barr also used the model to simulate well concentrations. Thus, though the defendant present reasonable arguments against the accuracy of the two models’ results—which go to the weight of Detwiler’s opinion—it is not apparent from this record that Detwiler used the models in a manner for which they were not intended. Finally, Baggett’s opinion is somewhat distinct in that he estimated PFOA concentrations at individual locations in the

⁵² 2018 Expert Report of David Sullivan (doc. no. [122](#)) at 13.

⁵³ [Id.](#) at 10-13.

MVDWW water distribution system. But Baggett completed this task using WaterGEMS, a model that Barr did not utilize.

It also bears noting that, according to Shin, each of the four models used by Barr and the plaintiffs' experts is "well-accepted and thus widely used in the field of environmental science and engineering." Specifically, in his report, Shin explained that:

All four models used in the Barr Engineering study were developed by the agencies of the U.S. government. The AERMOD model is recognized as a preferred and recommended model by the U.S. EPA for modeling dispersion of air pollutants since 2005. The USGS's MODFLOW and MT3D were developed in the early 1980s and 1990, respectively, and widely used thereafter. The USGS's SWB model was developed in 2010 and is currently the preferred method for distributing net infiltration of precipitation in space and time for use in applied groundwater modeling. Because of reliability and maturity of the four models, they are well-accepted and thus widely used in the field of environmental science and engineering.⁵⁴

The court accordingly finds that the experts' use of the Barr models does not render their opinions unreliable and excludable.

The defendants also raise a broader challenge regarding AERMOD, which the court does not consider a basis for exclusion, either. They argue that the model does not reliably predict "geographic spatial distribution" of PFOA.⁵⁵ Other courts have admitted expert analysis of PFOA distribution based on AERMOD, however. See Baker v. Saint-Gobain Performance Plastics Corp., No. 116CV0917LEKDJ, 2021 WL 2548825, at *11 (N.D.N.Y. May 7, 2021) (finding an expert's opinion based on AERMOD reliable for predicting air transport of PFOA to a class area in Hoosick Falls, New York); Sullivan v.

⁵⁴ 2020 Expert Report of Hyeong-Moo Shin (doc. no. 379-19) at 8.

⁵⁵ Defs.' Mot. to Exclude Fate and Transport Experts (doc. no. 306-1) at 18-19.

[Saint-Gobain Performance Plastics Corp.](#), No. 5:16-CV-125, 2019 WL 12323322, at *9 (D. Vt. July 15, 2019) (the “AERMOD program . . . is one of the most widely-used methods of measuring the plume of airborne contaminants from a smokestack or other fixed source”). Further, Sullivan provided a reasonable explanation for his use of the model, supported by citations to scientific literature, and he addressed some of the model’s limitations in his report. Specifically, he explained that “if an air quality model such as AERMOD were to be used to model concentration at a specific hour, day, and location, . . . the results would not be expected to be accurate.”⁵⁶ Sullivan added that his study “addresses long-term averaging of concentration of deposition” and is thus “not affected by this limitation” in the model.⁵⁷

In sum, the plaintiffs have sufficiently shown that their experts employed methods and models that are accepted in their fields to achieve their purpose of modeling the movement of Saint-Gobain’s PFOA emissions from air to groundwater across areas and/or in MVDWW wells—an objective that is not clearly outside of the scope and design of the four Barr models.⁵⁸ The defendants’ additional critiques of the comprehensiveness of and assumptions underlying the Barr models, as applied by the

⁵⁶ 2020 Expert Report of David Sullivan (doc. no. [378-9](#)) at 25.

⁵⁷ [Id.](#)

⁵⁸ The defendants further assert that Barr’s models are unreliable for the purposes of this case because Barr’s analysis had a regulatory motive. The defendants do not meaningfully develop this argument. In particular, they do not provide sufficient factual or legal support for the contention that this regulatory purpose limits the utility or applicability of the models for the plaintiffs’ experts’ analysis.

plaintiffs’ experts, go to the weight, and not the admissibility of the experts’ opinions.

See [Koninklijke Philips N.V. v. Zoll Med. Corp.](#), 256 F. Supp. 3d 50, 52 (D. Mass. 2017)

(“When a dispute exists between two experts both of whom use reliable methods, that dispute ‘[goes] to the weight, not the admissibility, of the testimony.’” (quoting

[Cummings v. Standard Register Co.](#), 265 F.3d 56, 65 (1st Cir. 2001))).

Alternative sources of PFOA. The defendants also argue that the challenged experts’ opinions are unreliable because they did not account for and rule out alternative sources of PFOA in the class areas, the presence of which is undisputed. In order to satisfy [Rule 702](#), the “expert[s] should ‘adequately account[] for obvious alternative explanations’” for PFOA contamination in the class areas. [Packgen v. Berry Plastics Corp.](#), 847 F.3d 80, 87 (1st Cir. 2017) (quoting Fed. R. Evid. 702 Advisory Comm. Note to 2000 Amendments). The experts need not, however, “eliminate every other possible cause” for contamination. [Id.](#); see also [Pagliaroni v. Mastic Home Exteriors, Inc.](#), No. CV 12-10164-DJC, 2015 WL 5568624, at *7 (D. Mass. Sept. 22, 2015) (“[a]s long as the expert opinion meets the requirements of [Rule 702](#), there is no additional requirement that an expert eliminate all alternative possible causes in offering a differential diagnosis.”)

Two of the plaintiffs’ experts, Sullivan and Shin, both considered alternative sources of PFOA, and explained their focus on Saint-Gobain as a dominant contributor to contamination across the class areas. In particular, Sullivan noted that the NHDES “has evaluated over 40 potential sources of PFOA emissions,” and the “only other identified airborne source of PFOA with quantified airborne emission rates is the Textiles Coated

Incorporated (TCI) facility that operated in Amherst, New Hampshire from 1985 to 2006.”⁵⁹ He opined that “[e]missions from TCI do not explain the pattern of deposition that occurs in the class geographic areas,” particularly the “decreasing trend of PFOA [groundwater] contamination with distance from” the facility.⁶⁰ He added that other potential sources of contamination identified by the defendants, such as Harcros Chemicals Incorporated and the Merrimack landfill, potentially had “localized” effects and “would not explain the general trend in the groundwater contamination pattern around [the] Saint-Gobain [facility].”⁶¹ Shin similarly found that other sources of PFOA listed in the Barr Report “did not cause PFOA groundwater contamination in the class area[s],” in part based on the pattern and concentration of measured contamination in the class areas and the lack of evidence linking the sources to widespread contamination.⁶²

In short, Sullivan and Shin acknowledged the presence of alternative sources of PFOA. They then relied, in part, on observations of contamination patterns, the locations of the alternative sources, and the sources’ volumes of emissions to discount their effects on class area contamination. Finally, they concluded that—notwithstanding the presence of alternative PFOA sources—Saint-Gobain’s emissions contributed to the groundwater contamination present across the class areas, even if the full volume of contamination on any given property may not be solely attributable to Saint-Gobain. This analysis of

⁵⁹ 2020 Expert Report of David Sullivan (doc. no. [378-9](#)) at 35.

⁶⁰ [Id.](#)

⁶¹ [Id.](#)

⁶² See 2020 Expert Report of Hyeong-Moo Shin (doc. no. [236-7](#)) at 15-16.

alternative sources is reasoned, grounded in relevant, available data, and sufficient to satisfy [Rule 702](#). To the extent that the defendants critique the experts because they do not conclude that Saint-Gobain is the only source of PFOA contamination in the class areas, the court does not find this to be a basis for exclusion.⁶³

Detwiler and Baggett’s estimates of PFOA in municipal water. The defendants next raise a number of critiques regarding Detwiler and Baggett’s modeling of contamination levels in MVDWW wells and individual taps served by the MVDWW system. For example, the defendants claim that Detwiler failed to properly test his models “through calibration, validation, or uncertainty analysis,” and he selected his Model 4 as the basis of his PFOA concentration estimates without an adequate explanation.⁶⁴ The plaintiffs argue that Baggett’s model should also be excluded because Baggett relied on Detwiler’s Model 4 without “independently verify[ing] that Model 4’s outputs are reasonable,” and Baggett also failed to appropriately calibrate his model.⁶⁵

Since the court previously determined that both experts are qualified to opine on these matters and they rely on accepted methods to do so, the defendants’ challenges constitute reasonable differences among experts. These challenges accordingly go to the weight, and not the admissibility, of the experts’ opinions.

⁶³ The defendants also contend that the presence of alternative sources of PFOA in the class areas precludes certification. The court addresses and rejects this argument in its Order on class certification. See Class Certification Order (doc. no. 438) at 44-48.

⁶⁴ Defs.’ Mot. to Exclude Fate and Transport Experts (doc. no. [306-1](#)) at 41.

⁶⁵ [Id.](#) at 46.

The absence of estimates of PFOA concentrations in private wells. Finally, the defendants point out that the plaintiffs’ fate and transport experts, and particularly Detwiler, have not modeled historical PFOA concentrations in private wells. According to the defendants, this omission undermines the foundation of the opinion of another one of the plaintiffs’ experts—Dr. Scott M. Bartell. Bartell opined on the health effects of PFOA exposure to putative class members, in support of the plaintiffs’ medical monitoring claims.

As presented, the plaintiffs’ challenge on this issue appears to be aimed at the reliability of Bartell’s opinion, and not the reliability of Detwiler’s opinion. Bartell is not a fate and transport expert and is not the subject of the current motion. Thus, the court need not delve further into this issue here. The court grants the defendants’ motion to exclude the plaintiffs’ fate and transport experts with respect to Vernon, but otherwise denies the motion.

B. Admissibility of the defendants’ fate and transport experts

The plaintiffs move to exclude parts of the opinions provided by the defendants’ fate and transport experts. Below, the court summarizes each report briefly, and then analyzes the strength of the plaintiffs’ challenges.

Michael Mobile. Michael Mobile, Ph.D. has a doctoral degree in civil engineering from Virginia Polytechnic Institute and State University, with an undergraduate degree in hydrology from the University of New Hampshire. His work focuses on quantitative hydrogeology and hydrology, “solute fate and transport, and water resources

management.”⁶⁶ He is a managing partner at McDonald Morrissey Associates, LLC. Before obtaining his Ph.D., he worked as a hydrogeologist at McDonald Morrissey.

Mobile issued two reports in this case, in 2019 and 2021. Mobile opined on the limitations of the Barr model as well as perceived flaws in the opinions of the plaintiffs’ fate and transport experts. His first report responded to Sullivan’s opinions, and his second report responded to the opinions of Sullivan, Shin, and Detwiler, although he focused on Detwiler more heavily.

The plaintiffs contend that Mobile is not qualified to give opinions about the modeling of air pollution because he is a hydrogeologist. In other words, the plaintiffs contend that Mobile’s area of expertise is water, and not air. The defendants, in turn, insist that Mobile is qualified to offer opinions about certain, general faults in Sullivan’s opinions. They also acknowledge, however, that they have another expert who specializes in the movement of PFOA through air—Lyle Chinkin.

In order to limit Mobile from straying outside of his area of expertise, he will not be permitted to opine on Sullivan’s analysis with respect to the movement of PFOA through air, including Sullivan’s use of AERMOD and his consideration of alternative sources of PFOA. Mobile may, however, offer opinions regarding Sullivan’s analysis to the extent that it pertains to the movement of PFOA through water, such as Sullivan’s assertions regarding the pattern of groundwater contamination in the class areas.

⁶⁶ 2021 Expert Report of Michael Mobile (doc. no. [404-4](#)) at 101.

The plaintiffs also contend that Mobile's opinions about possible, alternative sources of PFOA are unreliable because they are not sufficiently supported by data and evidence. The defendants did not respond to this specific challenge.⁶⁷ Nevertheless, these purported weaknesses in Mobile's opinions do not render his opinion unreliable to the extent that they should be excluded.

Lyle Chinkin. Lyle Chinkin has B.S. and M.S. degrees in atmospheric science from University of California, Davis, and he has worked in the areas of meteorology, air quality, air pollution, and emissions modeling. Chinkin opined on the analysis and reports of Sullivan, Shin, and Detwiler, including their assessment of alternative sources of PFOA in the class areas.

The plaintiffs contend that Chinkin is not qualified to opine on their experts' analysis of alternative sources because he lacks sufficient expertise in the fate and transport of PFOA through groundwater. The defendants, in turn, assert that Chinkin has the requisite qualifications to identify a need for further investigation of alternative sources, even if he lacks the expertise needed to conduct such an investigation. Consistent with Chinkin's qualifications, his opinions and testimony will be limited to matters of air fate and transport.

The plaintiffs also contend that Chinkin's opinions regarding emissions from the TCI facility are unsupported and should thus be excluded. They argue that, instead of

⁶⁷ The defendants discussed expert opinions on alternative sources of PFOA generally, but they did not address Mobile's assertions about alternative sources, such as New Hampshire Plating, Harcros Chemicals, the Merrimack Landfill, car washes, and fire stations. See Defs.' Objection to Pls.' Mot. to Exclude Expert Testimony (doc. no. 370) at 45-47.

completing his own research, investigation, and analysis of the TCI facility's emissions, Chinkin merely repeated the NHDES's findings on the matter. The sufficiency of the data underlying Chinkin's opinions on the TCI facility go to the weight, and not the admissibility, of those opinions, and is best tested through cross-examination. The plaintiffs' remaining challenges to Chinkin's opinion similarly do not support exclusion, and can be addressed through contrary evidence and cross-examination.

John Connor and Sorab Panday. John Connor and Sorab Panday provided a joint expert report that addressed the modeling of PFOA in groundwater and in the MVDWW distribution system. Connor has an M.S. degree in civil engineering from Stanford University and is a board-certified environmental engineer and a geotechnical engineer. He is the president of GSI Environmental Inc. and has more than 40 years experience in environmental risk management. Sorab Panday, Ph.D. has a doctoral degree in civil and environmental engineering from Washington State University. He is a principal engineer at GSI Environmental and has 32 years experience in the use of flow and transport models for water contamination evaluations and resource management.

In their report, Connor and Panday explained that "the ratio of PFOA to PFOS" measured within groundwater "can be used to ascertain the differences in the sources of PFAS."⁶⁸ More specifically, they asserted that "[a]reas of impacted groundwater that contain[] PFAS compounds with similar ratios of PFOA to PFOS may have been

⁶⁸ In their report, Connor and Panday defined PFOS as "the per- and polyfluoroalkyl substances (PFAS) specified in the complaint." 2021 Expert Report of John Connor and Sorab Panday (doc. no. 356-4) at 6.

impacted by the same or similar sources, while groundwater areas with very different ratios are unlikely to have been impacted by the same source.”⁶⁹

Applying this theory, Connor and Panday compared the ratios of PFOA to PFOS at the Saint-Gobain facility and various other locations within the class areas. They found that the ratio in the groundwater at the facility site is higher than the ratios in the MVDWW wells, private wells, and other sites, indicating differences in sources across the areas.

The plaintiffs contend that the experts’ ratio theory is unreliable and lacking in evidentiary support. They argue that the different ratios that Connor and Panday observed do not necessarily indicate distinct PFOA sources, but can also be explained by variations in emission composition from a single source. As stated, the plaintiffs dispute the inferences that can be drawn from Connor and Panday’s observations, but they do not sufficiently establish that the ratio theory itself, or the experts’ methodology, is unreliable. Thus, the plaintiffs’ challenge is better addressed through the adversary process, rather than the exclusion of Connor and Panday’s opinion.

The plaintiffs also contend that Connor did not provide a reliable basis for his opinion that Baggett should have calibrated his model results by comparing them to PFOA measurements from five to ten percent of the residences connected to the MVDWW system. The defendants concede that Connor asserted this opinion during his

⁶⁹ [Id.](#) at 34.

deposition, and it did not appear in his report. Given this admission, Connor will not be permitted to provide this specific opinion regarding Baggett's calibration of his model.

C. Admissibility of the plaintiffs' damages experts

Next, the defendants move to exclude the plaintiffs' two experts on economic damages. Again, the court begins by summarizing the experts' opinions and then proceeds to weigh the defendants' arguments for exclusion.

1. Randall Bell

Randall Bell holds a Ph.D. in human and organizational systems, and he "specializes in real estate damage economics and valuation."⁷⁰ The plaintiffs tasked Bell to "quantify damages for residential property owners impacted by the Saint-Gobain contamination."⁷¹ Bell used mass appraisal techniques to estimate the aggregate diminution in property value resulting from PFOA contaminants in household water supplies. Based on this analysis, Bell found that the total diminution in value damages are "not less than \$577,935,862."⁷²

Some background on mass appraisal, and its applicability in this context, is important at the outset. Mass appraisal is the "process of valuing a universe of properties as of a given date using standard methodology, employing common data, and allowing for statistical testing."⁷³ According to Bell, the impact of PFOA contamination on

⁷⁰ 2020 Expert Report of Randall Bell (doc. no. [299-11](#)) at 206.

⁷¹ 2018 Declaration of Randall Bell (doc. no. [299-9](#)) at 3.

⁷² 2020 Expert Report of Randall Bell (doc. no. [299-11](#)) at 203.

⁷³ [Id.](#) at 62 (quoting Appraisal Foundation, USPAP Standard 6; International Association of Assessing Officers, Standard on Mass Appraisal of Real Property).

property values in this case is well suited for estimation on a class-wide basis using mass appraisal techniques because there is a “single identifiable source” and type “of contamination,” in an area with common geographical boundaries, consisting of a “common property type[]” (residential property), accompanied by “ample market data.”⁷⁴ Bell further explained that a class-wide analysis is appropriate because contamination, particularly direct exposure to contamination, raises common concerns about adverse health effects, the ability to market and finance property, the likelihood or effectiveness of mitigation, limitations on the use of property, future liability, and more. These concerns, according to Bell, create a risk element or “stigma” that “tend[s] to reduce property values across an area” in a manner that is “not unique to any individual parcel of property within the affected area.”⁷⁵

Bell primarily focused his analysis on single-family residences and condominiums within the class areas in Litchfield, Merrimack, Bedford, and Manchester. He first developed a regression to estimate the values of the class properties absent contamination, or the unimpaired values. He completed separate regressions for single family homes and condominiums since, according to Bell, they are considered distinct for mass appraisal purposes. The regression included several independent variables—the number of bathrooms, date of sale, age, lot and/or home size, and location (Bedford, Manchester, Litchfield, and Merrimack)—and a dependent variable of sale or rent price.

⁷⁴ 2018 Declaration of Randall Bell (doc. no. [299-9](#)) at 12-13.

⁷⁵ [Id.](#) at 8-9.

Bell ran the regression on local sales data from 2012 through 2019. He excluded six transactions from the dataset because they were at least partially “informed,” that is, “certain market participants” in those transactions “may have [had] some fragmented awareness of the household water PFAS issues.”⁷⁶ By removing those transactions, Bell asserted that the data he used belonged to sales in which PFOA contamination was either not disclosed or disclosed in a neutral, positive, or ambiguous manner, and thus did not meaningfully affect the sale price.⁷⁷

Next, Bell used several mass appraisal techniques to estimate the reduction in property value due to contamination, or the impaired property values. He separated this analysis into “risk effects” and “use effects.” Risk effects refer to the perception of environmental risk, and use effects reflect “the loss of conventional use of the subject properties due to household water PFAS contaminant issues.”⁷⁸

First, based on a literature review, Bell estimated that use effects result in at least a 15% reduction in property values for properties with contamination levels greater than the regulatory maximum contaminant limit. Throughout his analysis, Bell applied the MCL of 12 parts per trillion, which the State of New Hampshire adopted in July 2020. He completed regression analysis to calculate class properties’ rental rates. He then combined the estimated property rental prices, the period of time for which

⁷⁶ 2020 Expert Report of Randall Bell (doc. no. [299-11](#)) at 89.

⁷⁷ See [id.](#) at 89, 165-68.

⁷⁸ [Id.](#) at 18.

contamination at each property was above 12 ppt, and the 15% use effect, and he calculated an aggregate use effect of not less than \$142 million.

Bell primarily used three mass appraisal techniques to quantify risk effects: a literature review, an analysis of published case studies regarding the effect of household drinking water contamination on the perception of risk, and paired sales analysis. First, Bell reviewed scientific literature on the effect of contaminated drinking water on property values, which revealed that contamination can lower property values by anywhere from .6% to 41.33%, with a midpoint at 20.96%.

Bell then reviewed published case studies analyzing how contaminants (including PFOA) in household drinking water in other communities, outside of the class areas, affected the perception of risk and the overall value of the properties. These case studies also provided a range of risk effects, from 6.3% to 33% for properties with contamination levels above the applicable MCL, and from 1% to 10% for properties with contamination levels below the applicable MCL. Bell identified the midpoint of these ranges as 19.7% and 5%, respectively.

And finally, Bell completed a paired sales analysis. Bell's paired sales analysis focused on six class area properties that were sold during the period relevant to this litigation, in which he found that the buyers were at least somewhat informed about the presence and detrimental nature of PFOA water contamination on the property. Bell accordingly reasoned that the sale prices in these transactions incorporated the effect of contamination.

In developing a method for determining the buyers' knowledge of detrimental contamination in the real estate transactions, Bell reasoned that PFOA is not overtly detectable, and media reports of PFOA contamination did not adequately reach buyers from other regions or contain information that was property-specific. Thus, according to Bell, "the sole means of accurate knowledge" of contamination on a particular property was through disclosure from sellers or agents.⁷⁹ Bell explained that Transfer Disclosure Statements in New Hampshire include questions regarding the condition of the household water and the presence of hazardous materials, and sellers or agents may disclose contamination issues in response to such questions.⁸⁰ Bell reviewed these disclosure forms from transactions that occurred between the beginning of the class period and March 2020, and he placed them into three categories. "Type 1" transactions involved "no significant disclosure of PFAS issues in household water"; "Type 2" transactions involved "neutral, positive, or ambiguous" disclosure; and "Type 3" transactions involved disclosure of the presence and "detrimental" nature of the contamination on the property.⁸¹

After identifying the six impaired sales transactions in his dataset, Bell compared the sale price of those properties with the sale price of comparable properties in other areas that were not known to be contaminated. Under the paired sales analysis method, the difference in the properties' sale prices is attributable to contamination. Based on this

⁷⁹ [Id.](#) at 13, 17.

⁸⁰ [Id.](#) at 15; [see also](#) Nov. 30, 2022 Morning Hearing Tr. (doc. no. [428](#)) at 12:8-24,

⁸¹ [Id.](#)

assessment, Bell found that the overall negative impact on property values due to contamination was 14%.

Bell finally pooled together his results from the different appraisal techniques in order to estimate a risk effect of 15% for properties with contamination levels above the MCL and 5% for properties with contamination levels below the MCL. He identified which properties in his study belong in each category using available well testing data and certain assumptions, applied the corresponding risk effect percentage to the estimated unimpaired values of the properties, and calculated an aggregate risk effect of not less than \$435 million.

Saint-Gobain challenges several aspects of Bell's opinion, but these critiques are either unsubstantiated or go to the weight, rather than the admissibility, of his opinion. Saint-Gobain first argues that Bell's analysis of the Transfer Disclosure Statements was results-oriented and inconsistent. During oral argument, the defendants presented Bell's analysis of several of the forms in an attempt to illustrate this purported inconsistency. Bell provided reasonable explanations for his approach to assessing buyers' knowledge, his definition of the three categories of buyers' knowledge, and his assignment of individual properties to those groups based on the disclosure forms.⁸² Contrary to the defendants' contention, the court does not find this part of Bell's analysis to be arbitrary to result-oriented, and instead concludes that it is reasonably supported and internally

⁸² See, e.g., Nov. 30, 2022 Morning Hearing Tr. (doc. no. 428) at 60:7-61:5 (Bell described his decision to assign a property to "Type 2" and not "Type 3" based on his conclusion that the disclosure form's discussion of contamination was "not property-specific.").

consistent, and adequate under [Rule 702](#). While experts can differ as to the proper categorization of some of the properties—and particularly whether the associated disclosure forms reflect detrimental characterizations of the contamination—these issues are best addressed through cross-examination and not exclusion. See [Koninklijke Philips](#), 256 F. Supp. 3d at 52 (“If an expert’s testimony is within ‘the range where experts might reasonably differ,’ the jury, not the trial court, should be the one to decide among the conflicting views of different experts.” (quoting [Kumho Tire Co. v. Carmichael](#), 526 U.S. 137, 153 (1999))).

Saint-Gobain also takes issue with Bell’s decision to model and estimate risk and use effects instead of using the available sales data from the class period as a representation of impaired property values. According to Saint-Gobain, Bell avoided using the available sales data for his impaired analysis because it shows a rise in property values over the relevant time period, which undermines the plaintiffs’ position. In response, Bell contends that the participants in all but six of the transactions in the sales dataset were not adequately informed of the contamination, so the corresponding sales did not incorporate the effect of contamination. To this, Saint-Gobain replies that Bell contradicted his own mass appraisal scholarship by insisting that market participants must be fully informed of contamination in order for the market price to be representative of impaired value. According to Saint-Gobain, the relevant literature provides that market participants need only be “typically” or “reasonably” informed in order for related transactions to form part of an impaired analysis.

Upon closer inspection, this dispute is largely a matter of semantics. While Bell used the phrase “fully informed” in his report when identifying the six sales that reflected the impaired value of properties, he also explained that participants in those six sales merely possessed “some fragmented awareness” of contamination. According to Bell, the remainder of the transactions (excluded from his impaired analysis) involved either no disclosure of contamination, or disclosures that represented the contamination as neutral, positive, or ambiguous.

In practice, then, Bell did not impose a “full” information requirement. Cf. [Mod. Holdings, LLC v. Corning, Inc.](#), 2022 WL 710174, at *14 (E.D. Ky. Mar. 9, 2022) (denying a motion to exclude the opinion of a mass appraisal expert who “after examining sales transactions, determined that the market data alone may not accurately reflect the true diminution in value of the bellwether Plaintiff properties because there was reason to believe that at least some of these sales transactions occurred without complete knowledge of the contamination situation in the neighborhood.”). Further, to the extent that the market data reflects a rise in property values in the class areas over the relevant period, as the defendants argue, this upward trend does not necessarily undermine Bell’s opinion. An overall rise in property values can be consistent with a diminution in value due to contamination, if the class area property values would have risen more absent the contamination.

In sum, Bell used a reasonable approach and methodology, along with relevant data, to estimate impaired values. His choice to exclude the bulk of actual sales data

from this analysis is not unreasonable, unsupported, or contradictory, and does not render his opinion inadmissible.

Saint-Gobain next identifies shortcomings in Bell's regression, related to his selection of variables and a lack of sensitivity testing. In his report, Bell explained that he reviewed mass appraisal textbooks, which list several relevant variables for the regression he completed, and he included the variables that are repeatedly cited in the literature, and for which he had accessible data. Further, according to Bell, his regression explained 82-85% of the variation in the dependent variable, "which is well within appraisal standards."⁸³

Bell's regression model is an accepted tool for mass appraisal, and he designed the regression with support from literature in the field. Further disputes regarding the variables that Bell included in his regression or the model's sensitivity to different parameters go to the weight, and not the admissibility, of his opinion. See [McMillan v. Massachusetts Soc. for Prevention of Cruelty To Animals](#), 140 F.3d 288, 303 (1st Cir. 1998) (noting that the expert's opinion was "focused, perceptive, and understandably compelling to the jury[,]” and thus “[i]f [the expert’s] analysis omitted what defendants argue are important variables, or was deficient in other respects . . . it was up to defendants to exploit and discredit the analysis during cross examination.”). Saint-Gobain's motion to exclude Bell's opinion is accordingly denied.

⁸³ Objection to Mot. to Exclude Randall Bell (doc. no. 377) at 14.

2. Jeffrey Carr

Carr holds a B.S. degree in animal science and an M.S. degree in agricultural science, and he is the President and Senior Economist at Economic and Policy Resources, Inc. Carr estimated the aggregate, or class-wide, costs associated with switching from private well water sources to municipal water sources due to PFOA contamination. To find this value, Carr calculated the difference between the total cost of municipal water and the total cost of owning, operating, and maintaining a private well, beginning with the dates on which the properties were connected to municipal water lines until 2030. He focused his analysis on Litchfield, Merrimack, and Bedford, and he selected the year 2030 as the endpoint of his study based on the “average duration of home ownership in the region.”⁸⁴

To determine the cost of municipal water, Carr began with a list of addresses in the three cities in which property owners switched from private wells to municipal water due to PFOA contamination, along with the time period during which the subject properties were connected to municipal water sources. Carr also obtained monthly municipal water billing information from Litchfield through January 2020, which detailed water consumption levels for the properties in that city. Carr also gathered information on the breakdown of municipal water costs in each city, which consists of a

⁸⁴ 2020 Expert Report of Jeffrey Carr (doc. no. [297-2](#)) at 3.

flat meter fee, a water consumption fee (a flat fee per centum cubic foot of water consumed), and “miscellaneous fees.”⁸⁵

Carr then projected future water consumption and utility costs in the three cities to estimate average municipal water costs through 2030. To estimate future costs, Carr assumed that the fees would rise at a rate “corresponding to the March 2001 to March 2020 annual average rate of growth of the consumer price index.”⁸⁶ He also approximated future average water consumption in the three cities based on past consumption trends, as reflected in the “detailed billing data” from households in Litchfield.⁸⁷

Next, Carr estimated that the average cost of maintaining and operating a private well is \$225. He based this number on quotes from service providers “Skillings & Sons, Inc. of Amherst, NH and Capital Well Cleaning Water Center of Lancaster, NH.”⁸⁸ The contact at Skilling & Sons told Carr that the cost depends on the well, including its location, filters, and age, and it “[m]ight cost \$120 for a tune up or \$250 for two hours of work” on the well.⁸⁹ The contact at Capital Well stated that a pumping system “is good for years but should be periodically tested,” and that it “costs between \$200 and \$250 for us to check it annually.”⁹⁰ During his deposition, Carr acknowledged that the \$225

⁸⁵ [Id.](#)

⁸⁶ [Id.](#) at 4.

⁸⁷ [Id.](#) at 4-5.

⁸⁸ [Id.](#) at 15.

⁸⁹ Exhibit to 2020 Expert Report of Jeffrey Carr (doc. no. [297-5](#)) at 2.

⁹⁰ [Id.](#)

estimate “does not explicitly account for all instances of failure, . . . testing, . . . breakdown in pumps,” and “electricity charges,” but he also pointed out that each address “is not going to have their pump break, . . . [and] is . . . [not] necessarily [going to] test their water every year professionally”⁹¹

Finally, Carr compared the aggregate private well costs with the aggregate municipal water costs for the affected properties over his selected time period. He concluded that the present value of additional costs incurred by class members who switched from private wells to municipal water is roughly \$2.6 million.

Saint-Gobain argues that Carr’s opinion is unreliable because his estimate of the maintenance and operating costs for private wells is not supported by sufficient or accurate data. According to Saint-Gobain, Carr omitted several private well operating costs, including the costs of a well pump, electricity, water softeners, and tests, and he relied on the cursory statements of service providers, one of whom merely quoted the cost of an annual maintenance check administered by his company.

“Sufficiency is the benchmark for an expert’s data under” [Rule 702](#). [Lawes v. CSA Architects & Engineers LLP](#), 963 F.3d 72, 101 (1st Cir. 2020). Indeed, “Rule 702 does not demand that experts rely on all data that could be deemed relevant. It does not even require the expert to seek out the best possible source of relevant information.” [Id.](#)

Carr’s estimate of private well operating and maintenance costs could have been supported by additional and more specific information, including market or survey data.

⁹¹ May 26, 2021 Deposition Tr. of Jeffrey Carr (doc. no. [297-3](#)) at 102:12-16, 102:22-103:4.

Carr’s own notes from his conversation with an individual at Skilling & Sons identify factors that cause these costs to vary—including well location, filters, and age—but Carr does not expressly incorporate these factors when calculating damages. Nevertheless, Carr’s estimate of private well maintenance and operating costs is based on some data that is relevant to his research question and not inaccurate; this is sufficient under [Rule 702](#).

Saint-Gobain also contends that Carr’s opinion should be excluded as irrelevant because, by estimating aggregate costs, it does not reflect any individual putative class member’s additional costs. Saint-Gobain also points out that Carr admitted during his deposition that his estimates do not “necessarily follow to each address because each individual address can have a different set of circumstances,” including differing “consumption levels.”⁹²

This does not render Carr’s opinion irrelevant. An expert opinion that rests on “an appropriate foundation” is relevant “as long as the testimony has a ‘tendency to make the existence of any fact that is of consequence to the determination of the action more probable or less probable than it would be without the evidence.’” [Pages-Ramirez v. Ramirez-Gonzalez](#), 605 F.3d 109, 115 (1st Cir. 2010) (quoting [Fed. R. Evid. 401](#)). Even if Carr’s opinion does not identify the additional utility cost paid by each or any individual putative class member, it provides an estimate of this amount, using an

⁹² [Id.](#) at 35:16-36:3.

accepted method and sufficient data, and is thus relevant to this damages issue. Saint-Gobain’s motion to exclude Carr’s opinion is thus denied.

D. Admissibility of the defendants’ damages experts

Finally, the plaintiffs move to exclude the opinions of three experts presented by the defendants in rebuttal to Bell or Carr. Below, the court summarizes and determines the admissibility of these experts’ opinions.

1. Thomas Hamilton

Thomas Hamilton holds a Ph.D. in Urban Land Economics and two M.S. degrees in Real Estate and Finance. He has developed and taught university courses in real estate economics and statistics and has also served as an expert for and consulted on “real estate related statistical studies for various tax assessment jurisdictions across the United States.”⁹³ Hamilton has also published “more than 20 refereed, academic and professional articles on valuation.”⁹⁴

Saint-Gobain offers Hamilton as a rebuttal expert to Bell. Hamilton completed an “appraisal review” in which he tested the accuracy and reliability of Bell’s unimpaired regression model. Hamilton cited academic articles that state that regression models are useful in providing estimates of the average, marginal effect of predictor variables on property values, but they are error-prone and unreliable when employed to estimate the value of individual properties. He then tested Bell’s regression model for accuracy using

⁹³ July 6, 2021 Expert Report of Thomas W. Hamilton (doc. no. [300-2](#)) at 12.

⁹⁴ [Id.](#)

a “generally recognized set of tests” employed by real estate economists.⁹⁵ For example, Hamilton compared Bell’s model results (predicted property values) to actual sale prices found in transactional data that Bell incorporated into his model. Through this and other analysis, Hamilton found that the model’s results had large error rates and were sometimes inconsistent with market realities. Hamilton attributed this error rate to flaws in the model, including the omission of key variables and the heterogeneity of the neighborhoods, towns, and individual properties comprising the class areas.

In their motion to exclude Hamilton’s opinion, the plaintiffs first argue that Hamilton lacks the requisite expertise to opine on Bell’s regression model. The plaintiffs note that Hamilton has never conducted an appraisal of damaged real estate or contaminated property. The plaintiffs do not explain how this specific gap in Hamilton’s experience renders him unqualified to complete the more general task of testing Bell’s regression model for accuracy and assessing its adherence to the standards of statistical analysis. The plaintiffs do not contend that Hamilton is unfamiliar with data-driven real estate valuation, nor do they assert that the methodologies and standards relevant to Hamilton’s assessment of Bell’s regression vary based on the type of property analyzed or the source of the impairment to the property.

The court concludes that Hamilton is qualified to opine on the accuracy and reliability of Bell’s regression model as a tool for estimating unimpaired property values, given Hamilton’s experience in real estate valuation. The fact that Hamilton has not

⁹⁵ [Id.](#) at 69.

appraised impaired residential properties himself goes to the weight, and not the admissibility, of his opinion. Cf. [Microfinancial, Inc. v. Premier Holidays Int'l, Inc.](#), 385 F.3d 72, 80 (1st Cir. 2004) (an Internal Revenue Service agent of 33 years with a focus on financial fraud was qualified to analyze the structure and fraudulent nature of transactions involving the transfer of funds into “lock-box accounts designated for consumer note payments,” though “he lacked direct experience in dealing with such [lock-box] accounts”); [Mitchell v. United States](#), 141 F.3d 8, 15 (1st Cir. 1998) (“The fact that the physician is not a specialist in the field in which he is giving his opinion affects not the admissibility of his opinion but the weight the jury may place on it.”).

The plaintiffs also argue that some of Hamilton’s opinions are unsupported by relevant literature, or not generally accepted in the appraisal profession. These arguments are overstated or insufficient to render Hamilton’s opinion inadmissible.

For example, the plaintiffs take issue with Hamilton’s opinion that the appraisal profession generally recognizes the limited role of regression models in estimating individual values of contaminated properties. Contrary to the plaintiffs’ contention, Hamilton’s assertions are not unsubstantiated. Both parties cite to textbooks or publications that either reinforce or undermine Hamilton’s position on this matter. The experts’ reasonable disputes on this and other issues related to regression modeling should be resolved by the factfinder. Accordingly, the court denies the plaintiffs’ motion to exclude Hamilton’s opinion.

2. Trevor Phillips

Trevor Phillips has been a certified general real estate appraiser since 1998. His “expertise includes analyzing property value diminution and other damages arising in real estate, environmental, construction defect, mortgage litigation, and other matters throughout the United States, including class action matters.”⁹⁶ Phillips is offered as a rebuttal expert to Bell, as well.

In his reports, Phillips generally asserted that the diminution in value of the class area properties cannot be analyzed using a class-wide valuation model because the properties present a diverse set of value-driving characteristics, such as locations, property types, interior conditions, and acquisition dates. Phillips also undertook his own paired sales analysis of 41 class properties. As discussed above, paired sales analysis is a mass appraisal technique in which contaminated properties are compared to similar, but uncontaminated properties. The difference in the sales price between the properties is attributed to contamination. Phillips found no indication of a diminution in value due to contamination among the 41 test properties in his paired sales analysis.⁹⁷

⁹⁶ July 11, 2019 Expert Report of Trevor Phillips (doc. no. [300-9](#)) at 5.

⁹⁷ The plaintiffs argue that Phillips’ conclusions from his paired sales analysis should be limited to the 41 properties that he analyzed. Based on its reading of Phillips’ reports, the court does not find that Phillips attempts to apply his paired sales analysis findings to properties other than the ones he analyzed. Indeed, in response to a question from the court during oral argument, Phillips asserted that his paired sales analysis “results are not applicable across every single putative class member’s property,” but may be “relevant” to other properties that are “very similar” to the ones he analyzed. Nov. 30, 2022 Afternoon Hearing Tr. (doc. no. [427](#)) at 61: 1-14. Given its faulty premise, the court does not delve further into the plaintiffs’ argument on this point.

In their motion to exclude Phillips' testimony, the plaintiffs argue that a few of Phillips' assertions should be excluded because they are outside of the scope of his expertise or impermissible legal conclusions. The court agrees with the plaintiffs on some of these points, as follows.

The plaintiffs contend that Phillips is not qualified to opine that they have failed to demonstrate uniform concentrations of PFOA across the class areas. The court agrees, and Saint-Gobain seemingly concedes this point by not rebutting it in its objection. Phillips is an expert on real estate appraisal, and matters related to the measurement of environmental contamination or the fate and transport of environmental contaminants are outside of the scope of his expertise. To be clear, Phillips is permitted to adopt the opinions of other, qualified experts on these matters. He is also qualified to opine on the importance (or lack thereof) of uniformity in PFOA concentrations for his appraisal analysis, to the extent that this forms part of his opinion as presented.

In his reports, Phillips also stated that certain class representatives' properties are not "typical" of the class properties due to their diverse attributes.⁹⁸ According to the plaintiffs, this is an inadmissible legal opinion. The plaintiffs are correct that Phillips' specific statement regarding a lack of typicality constitutes a legal conclusion that is inadmissible. See [Gomez v. Rivera Rodriguez](#), 344 F.3d 103, 114 (1st Cir. 2003) ("Courts generally have held legal opinion testimony inadmissible under [Fed. R. Evid. 702.](#)"). In detailing this opinion, Phillips described various attributes of the class

⁹⁸ July 11, 2019 Expert Report of Trevor Phillips (doc. no. [300-9](#)) at 7.

representatives' property, and how they differ from the characteristics of the other class area properties. This supporting analysis is admissible, as it does not constitute a legal conclusion and is within Phillips' scope of expertise.

The plaintiffs further assert that Phillips is not qualified to critique Bell's use of case studies, and Bell's results from that analysis, because Phillips has never completed case studies related to household water contamination. Similarly, according to the plaintiffs, Phillips is not qualified to opine on the drawbacks of Bell's regression model. The plaintiffs note that Phillips has not published any articles on the use of statistical studies for real estate valuation, he has never run or formulated a regression, and he does not hold himself out as an expert on statistical analysis. Saint-Gobain, in turn, does not refute the plaintiffs' characterization of Phillips' background, but instead points to several articles and publications that support Phillips' position on this matter.

The court concludes that, based on his experience and background as a real estate appraiser, Phillips is qualified to provide opinions on the general usefulness of different mass appraisal techniques in different scenarios, even if he has not employed these techniques at all or in the specific context of household water contamination. Again, as with Hamilton, the limitations in Phillips' specific experience goes to the weight, and not the admissibility, of his opinions on these particular issues.

The bulk of the plaintiffs' remaining critiques concern the manner in which Phillips conducted his paired sales analysis, the data he relied on, and the reliability of his results. For example, the plaintiffs critique Phillips for selecting control properties without confirming that they are free of contamination; failing to apply a time adjustment

before comparing properties sold in different years; using total sale price, instead of price per square foot, in his analysis; and more. Given that paired sales analysis is an accepted appraisal methodology and Phillips is qualified to conduct the analysis, “[i]f the factual underpinnings” of his analysis are “in fact weak, that [is] a matter affecting the weight and credibility of [Phillips’] testimony,” and not its admissibility. [Payton v. Abbott Labs](#), 780 F.2d 147, 156 (1st Cir. 1985). Thus, the motion to exclude Phillips’ testimony is granted in part, with respect to his opinions regarding the uniformity of PFOA contamination in the class areas and the typicality of the class representatives’ properties, but otherwise denied.

3. Charles Mullin

Charles Mullin has a Ph.D. in economics and is an “expert on statistical and econometric analysis, economic and microsimulation modeling, and insurance allocation.”⁹⁹ He has taught university courses in advanced statistical analysis and is published in the field of applied and theoretical econometrics. “[A] substantial portion of [his] work” focuses on insurance coverage, but he has also been retained “to evaluate potential damages claims arising from the discovery of [PFOA] contamination.”¹⁰⁰ Saint-Gobain offers Mullin to rebut the opinion of Carr, the plaintiffs’ expert on the cost of forced abandonment of private wells.

⁹⁹ July 6, 2021 Expert Report of Charles H. Mullin (doc. no. [356-11](#)) at 5.

¹⁰⁰ [Id.](#)

Mullin asserted that Carr's analysis is flawed because it omits several costs associated with operating private wells, and it fails to account for differences among class members that affect their damages, including water treatment needs, electricity costs, and factors affecting the rate of well component deterioration. Upon incorporating this and other information into the damages estimate, Mullin found that there is no economic harm to class members who were forced to switch from private wells to municipal water sources.

The plaintiffs argue that Mullin is not qualified to offer this opinion because he is not an expert on real estate appraisal or the fate and transport of environmental contaminants. The plaintiffs' critique is inapplicable, given the nature of Mullin's opinion. Mullin focuses on the format and content of the data and model Carr uses to estimate the costs of municipal water consumption and private well maintenance and operation. Mullin's background in economics and statistical modeling qualifies him to render an opinion, like this one, on the flaws of a data-driven model for estimating the cost of products and services. Mullin does not need more specific expertise in real estate appraisal or environmental contamination to opine as he has in this case, since he is not offering an opinion focused on either of those subjects.

The plaintiffs' remaining challenges to Mullin's opinion either misstate the content of his report or do not go to admissibility. At one point in his report, Mullin stated that there is a revealed preference for municipal water sources over household water in the United States, and the plaintiffs claim that this assertion rests on data that

Mullin “did not include in his report and is unwilling to produce.”¹⁰¹ Mullin, however, cited a report published by the U.S. Geological Survey entitled “Domestic Water Use” to support his proposition.¹⁰² Mullin also testified during his deposition that other sources align with this revealed preference, but he could not cite those sources because they are not publicly available.¹⁰³ Mullin’s failure to disclose the latter sources does not render his statement insufficiently supported and thus inadmissible, given that he also cites the USGS paper. Indeed, [Rule 702](#) requires that experts base their opinions on sufficient data, but “[Rule 702](#) does not demand that experts rely on all data that could be deemed relevant . . . [or] the best possible source of relevant information.” [Lawes](#), 963 F.3d at 101.

The plaintiffs also question the reliability of some of the data Mullin used to calculate the cost of operating and maintaining private wells, including data on well pressures and pump motor efficiencies. The plaintiffs assert that Mullin obtained the data from a website, and Mullin does not know how the data was developed. Once again, this critique of the volume and quality of the data underlying Mullin’s opinion does not render his opinion or related calculations inadmissible.

Finally, the plaintiffs assert that, by introducing additional and specific factors to be considered when calculating the cost of switching to municipal water sources, Mullin demands more precision than the law requires when estimating damages. As a result,

¹⁰¹ Pls.’ Mot. to Exclude Expert Testimony (doc. no. [307-1](#)) at 73.

¹⁰² July 6, 2021 Expert Report of Charles H. Mullin (doc. no. [356-11](#)) at 25.

¹⁰³ See Aug. 30, 2021 Deposition Tr. of Charles Mullin (doc. no. [371](#)) at 243:3-245:13.

according to the plaintiffs, Mullin’s opinion will not “help the trier of fact” to understand the evidence or to determine a fact in issue, as required under [Rule 702](#).¹⁰⁴ This argument goes too far, by incorrectly suggesting that [Rule 702](#) constrains experts from offering opinions or critiques that may exceed the applicable burdens of proof or legal standards. The court denies the plaintiffs’ motion to exclude Mullin’s opinion.

IV. Conclusion

For these reasons, the defendants’ motion to exclude the opinions of the plaintiffs’ fate and transport expert witnesses¹⁰⁵ is GRANTED as to Dr. James Vernon and is otherwise DENIED. The plaintiffs’ motion to exclude the opinions of the defendants’ experts¹⁰⁶ is GRANTED-in-part and DENIED-in-part, as described in Sections III.B and III.D. Finally, the defendants’ motions to exclude the plaintiffs’ damages experts are DENIED.¹⁰⁷

SO ORDERED.



 Joseph N. Laplante
 United States District Judge

Dated: December 29, 2023

cc: Counsel of record

¹⁰⁴ See Pls.’ Mot. to Exclude Expert Testimony (doc. no. [307-1](#)) at 75.

¹⁰⁵ Doc. no. [306](#).

¹⁰⁶ Doc. no. [307](#).

¹⁰⁷ Doc. nos. [297](#), [299](#).